

CLAIMS

1. A method for determining force exerted on a vehicle wheel, the vehicle wheel comprising a radius part between a hub and a radially outermost annular ground contacting part, the method comprising:

obtaining data on functionality between the force exerted on a vehicle wheel and a physical parameter of the vehicle wheel at at least one predetermined measuring position;

making a formula of the physical parameter for the force, using the obtained data on the functionality;

measuring the physical parameter of the vehicle wheel during rolling; and

computing the formula using the measured physical parameter to work out the force.

2. The method according to claim 1, wherein

the force is at least one of a vertical force, lateral force, longitudinal force and torque.

3. The method according to claim 1, wherein

the radially outermost annular ground contacting part is a tire, and the radius part is a wheel disk of a wheel on which the tire is mounted.

4. The method according to claim 1, wherein

the physical parameter is the magnitude of a radial strain in the radius part.

5. The method according to claim 1, wherein

said at least one predetermined measuring position is a twelve-o'clock position (P3), three-o'clock position (P4), six-o'clock position (P1) and nine-o'clock position (P2) which are arranged at every 90 degrees around the rotational axis of the vehicle wheel.

6. The method according to claim 1, wherein
the measuring of the physical parameter includes:
locating a sensor for the physical parameter which is fixed to the radius part; and
reading the sensor when the sensor is at said at least one predetermined measuring position.
7. The method according to claim 1, wherein
the measuring of the physical parameter includes:
locating a plurality of sensors for the physical parameter which are fixed to the radius part; and
reading each said sensor when the sensor is at at least one of said at least one predetermined measuring position.
8. The method according to claim 1, wherein
the measuring of the physical parameter includes:
locating a plurality of sensors for the physical parameter which are fixed to the radius part; and
reading each said sensor when the sensor is each of said at least one predetermined measuring position.
9. A device for determining force exerted on a vehicle wheel comprising:

at least one sensor for a physical parameter of the vehicle wheel,

a memory on which data on functionality between the force and physical parameter are stored,

a processor which, using data on the physical parameter read from said at least one sensor and the stored data on functionality, works out the force and outputs data on the force.

10. A device according to claim 9, wherein

said physical parameter is the magnitude of radial strain on a radius part of the vehicle wheel,

11. A device according to claim 9, wherein

said at least one sensor is one sensor fixed to a radius part of the vehicle wheel,

12. A device according to claim 9, wherein

said at least one sensor is a plurality of sensors arranged around the rotational axis of the vehicle wheel and fixed to a radius part of the vehicle wheel

13. A device according to claim 9, which further includes a device to locate said at least one sensor in order to measure the physical parameter when the sensor is at a predetermined measuring position

14. A device according to claim 9, wherein

the data stored on the memory include data on functionality between the physical parameter and at least one of

vertical force, lateral force, longitudinal force and self-aligning torque

15. A brake system including
 - the device according claim 9 to determine a breaking force during braking,
 - a braking mechanism for the vehicle wheel, and
 - a controller for controlling the braking mechanism so that the breaking force becomes maximum during braking.